## STIC Biotechnology Systems Branch
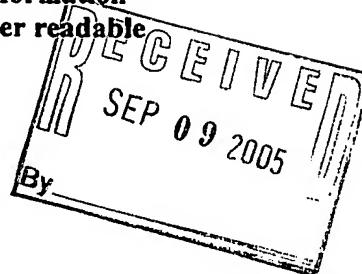
## RAW SEQUENCE LISTING
## ERROR REPORT

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: _10/797,553C_

Source: _TWO_

Date Processed by STIC: _8/29/05_

**THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.**
**PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:**
1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY
**FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, TELEPHONE: 571-272-2510; FAX: 571-273-0221**

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE **CHECKER VERSION 4.2.2 PROGRAM**, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:
> **http://www.uspto.gov/web/offices/pac/checker/chkrnote.htm**

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.
Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.
Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<http://www.uspto.gov/ebc/efs/downloads/documents.htm> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry, Federal Express, United Parcel Service, or other delivery service (EFFECTIVE 01/14/05): U.S. Patent and Trademark Office, Mail Stop Sequence, Customer Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314

Revised 01/24/05

**Raw Sequence Listing Error Summary**

| ERROR DETECTED | SUGGESTED CORRECTION |
|---|---|

SERIAL NUMBER: 10/797,553C

**ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE**

1____ Wrapped Nucleics   The number/text at the end of each line "wrapped" down to the next line. This may occur if your file
      Wrapped Aminos      was retrieved in a word processor after creating it. Please adjust your right margin to .3; this will
                          prevent "wrapping."

2____ Invalid Line Length   The rules require that a line not exceed 72 characters in length. This includes white spaces.

3____ Misaligned Amino   The numbering under each 5th amino acid is misaligned. Do not use tab codes between numbers;
      Numbering           use space characters, instead.

4____ Non-ASCII   The submitted file was not saved in ASCII(DOS) text, as required by the Sequence Rules. Please
                  ensure your subsequent submission is saved in ASCII text.

5____ Variable Length   Sequence(s) 56 contain n's or Xaa's representing more than one residue. Per Sequence Rules,
                        each n or Xaa can only represent a single residue. Please present the maximum number of each
                        residue having variable length and indicate in the <220>-<223> section that some may be missing.

6____ PatentIn 2.0   A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid
      "bug"          sequences(s) _____. Normally, PatentIn would automatically generate this section from the
                     previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to
                     the subsequent amino acid sequence. This applies to the mandatory <220>-<223> sections for
                     Artificial or Unknown sequences.

7____ Skipped Sequences   Sequence(s) _____ missing. If intentional, please insert the following lines for each skipped sequence:
      (OLD RULES)         (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
                          (i)      SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading)
                          (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
                          This sequence is intentionally skipped

                          Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to include the skipped sequences.

8____ Skipped Sequences   Sequence(s) _____ missing. If intentional, please insert the following lines for each skipped sequence.
      (NEW RULES)         <210> sequence id number
                          <400> sequence id number
                          000

9____ Use of n's or Xaa's   Use of n's and/or Xaa's have been detected in the Sequence Listing.
      (NEW RULES)           Per 1.823 of Sequence Rules, use of <220>-<223> is MANDATORY if n's or Xaa's are present.
                            In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

10____ Invalid <213>   Per 1.823 of Sequence Rules, the only valid <213> responses are: Unknown, Artificial Sequence, or
       Response        scientific name (Genus/species). <220>-<223> section is required when <213> response is Unknown or
                       is Artificial Sequence

11____ Use of <220>   Sequence(s) _____ missing the <220> "Feature" and associated numeric identifiers and responses.
                      Use of <220> to <223> is MANDATORY if <213> "Organism" response is "Artificial Sequence" or
                      "Unknown." Please explain source of genetic material in <220> to <223> section.
                      (See "Federal Register," 06/01/1998, Vol. 63, No. 104, pp. 29631-32)   (Sec. 1.823 of Sequence Rules)

12____ PatentIn 2.0   Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file,
       "bug"          resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence
                      listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.

13____ Misuse of n/Xaa   "n" can only represent a single nucleotide; "Xaa" can only represent a single amino acid

AMC – Biotechnology Systems Branch – 09/09/2003

# BEST AVAILABLE COPY

IFWO

RAW SEQUENCE LISTING      DATE: 08/29/2005
PATENT APPLICATION:   US/10/797,553C     TIME: 15:32:06

Input Set : **A:\SEQUENCE LISTING.1092.txt**
Output Set: **N:\CRF4\08292005\J797553C.raw**

```
 3 <110> APPLICANT: Moyle, William R.
 4         Xing, Yongna
 6 <120> TITLE OF INVENTION: Protein Knobs
 8 <130> FILE REFERENCE: 1092/US PCT
10 <140> CURRENT APPLICATION NUMBER: 10/797,553C
11 <141> CURRENT FILING DATE: 2004-03-10
13 <160> NUMBER OF SEQ ID NOS: 66
15 <170> SOFTWARE: PatentIn version 3.1
```

**Does Not Comply
Corrected Diskette Needed**
(Pg. 1-10)

ERRORED SEQUENCES

```
1163 <210> SEQ ID NO: 36
1164 <211> LENGTH: 145
1165 <212> TYPE: PRT
1166 <213> ORGANISM: Homo sapiens
1168 <400> SEQUENCE: 36

1170 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1171 1               5                  10                  15
1174 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1175             20                  25                  30
1178 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1179         35                  40                  45
1182 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1183         50                  55                  60
1186 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1187 65                  70                  75                  80
1190 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1191             85                  90                  95
1194 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1195             100                 105                 110
1198 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1199         115                 120                 125
1202 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 1203     130                 135                 140              145
```

```
1206 <210> SEQ ID NO: 37
1207 <211> LENGTH: 145
1208 <212> TYPE: PRT
1209 <213> ORGANISM: Artificial Sequence
1211 <220> FEATURE:
1212 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser138
1214 <400> SEQUENCE: 37
1216 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
```

**RAW SEQUENCE LISTING**
**PATENT APPLICATION: US/10/797,553C**

DATE: 08/29/2005
TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
1217 1                    5                    10                   15
1220 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1221          20                   25                   30
1224 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1225          35                   40                   45
1228 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1229          50                   55                   60
1232 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1233 65                   70                   75                   80
1236 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1237          85                   90                   95
1240 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1241          100                  105                  110
1244 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1245          115                  120                  125
1248 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1249     130                  135                  140
1252 <210> SEQ ID NO: 38
1253 <211> LENGTH: 145
1254 <212> TYPE: PRT
1255 <213> ORGANISM: Artificial Sequence
1257 <220> FEATURE:
1258 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b
1259          eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
1260          8
1262 <400> SEQUENCE: 38
1264 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1265 1                    5                    10                   15
1268 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1269          20                   25                   30
1272 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1273          35                   40                   45
1276 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1277          50                   55                   60
1280 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1281 65                   70                   75                   80
1284 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1285          85                   90                   95
1288 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1289          100                  105                  110
1292 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1293          115                  120                  125
1296 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 1297     130                  135                  140
1300 <210> SEQ ID NO: 39
1301 <211> LENGTH: 145
1302 <212> TYPE: PRT
1303 <213> ORGANISM: Artificial Sequence
1305 <220> FEATURE:
```

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
 1306 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b
 1307    eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
 1308    8, and Serine38 in the beta-subunit carboxyterminus of this
 1309    analog was replaced with Cys
 1311 <400> SEQUENCE: 39
 1313 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1314 1               5                   10              15
 1317 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1318             20                  25              30
 1321 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1322         35                  40              45
 1325 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1326     50                  55              60
 1329 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
 1330 65                  70              75                  80
 1333 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1334             85                  90                  95
 1337 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
 1338             100                 105             110
 1341 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 1342         115                 120             125
 1345 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1346     130                 135             140
 1709 <210> SEQ ID NO: 45
 1710 <211> LENGTH: 125
 1711 <212> TYPE: PRT
 1712 <213> ORGANISM: Artificial Sequence
 1714 <220> FEATURE:
 1715 <223> OTHER INFORMATION: hCGbeta,delta116-135,S138C
 1717 <400> SEQUENCE: 45
 1719 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1720 1               5                   10              15
 1723 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1724             20                  25              30
 1727 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1728         35                  40              45
 1731 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1732     50                  55                  60
 1735 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1736 65                  70                  75                  80
 1739 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1740             85                  90                  95
 1743 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1744             100                 105             110
 1747 Pro Arg Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1748     115                 120
 1843 <210> SEQ ID NO: 48
 1844 <211> LENGTH: 140
 1845 <212> TYPE: PRT
```

RAW SEQUENCE LISTING                    DATE: 08/29/2005
PATENT APPLICATION:  US/10/797,553C         TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
1846 <213> ORGANISM: Artificial Sequence
1848 <220> FEATURE:
1849 <223> OTHER INFORMATION: hCGbeta,delta131-135,S138C
1851 <400> SEQUENCE: 48
1853 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1854 1               5                   10                  15
1857 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1858             20                  25                  30
1861 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1862         35                  40                  45
1865 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1866     50                  55                  60
1869 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1870 65                  70                  75                  80
1873 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1874                 85                  90                  95
1877 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1878             100                 105                 110
1881 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1882         115                 120                 125
1885 Pro Ser Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1886     130                 135
2123 <210> SEQ ID NO: 56
2124 <211> LENGTH: 10
2125 <212> TYPE: PRT
2126 <213> ORGANISM: Artificial Sequence
2128 <220> FEATURE:
2129 <223> OTHER INFORMATION: Xl-Asp-Asp-Asp-Asp-Lys-Ser-Ym-Cys-Zn, where X, Y, and Z
refer to
2130     any tail portion amino acids and l, m, and n refer to the lengths
2131     of the tail portion amino acids
2133 <220> FEATURE:
2134 <221> NAME/KEY: MISC_FEATURE
2135 <223> OTHER INFORMATION: Xaa refers to any tail portion amino acids and n refers to
the
2136     lengths of the tail portion amino acids
2140 <400> SEQUENCE: 56
E--> 2142 Xaa Asp Asp Asp Asp Lys Ser Xaa Cys Xaa
E--> 2143 1               5                   10
2147 <210> SEQ ID NO: 57
2148 <211> LENGTH: 92
2149 <212> TYPE: PRT
C--> 2150 <213> ORGANISM: Artifical Sequence
2152 <220> FEATURE:
2153 <223> OTHER INFORMATION: An hCG truncated (-subunit analog fused to the hCG alpha-
carboxyterminus
2155 <400> SEQUENCE: 57
2157 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2158 1               5                   10                  15
2160 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2161             20                  25                  30
2163 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
```

*[handwritten annotations]: 140; pls explain source of genetic material.; refer to lengths — See item #5 on error summary sheet, N's are not permitted in the sequence.; 92 /07 found; These amino acids are misaligned, pls see item #3 on error summary sheet*

RAW SEQUENCE LISTING      DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C      TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
2164           35                    40                   45
2166 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2167      50                    55                   60
2169 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2170 65                    70                   75                   80
2172 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Asp Asp Pro Arg
2173 85 90            85       95            90                    98
2175 Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
2176 100 105      100        105
```
E--> 2173
E--> 2176

← misaligned numbering

```
2178 <210> SEQ ID NO: 58
2179 <211> LENGTH: 145
2180 <212> TYPE: PRT
2181 <213> ORGANISM: Artificial Sequence
2183 <220> FEATURE:
2184 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg94
2186 <400> SEQUENCE: 58
2188 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2189 1                5                    10                   15
2192 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2193           20                    25                   30
2196 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2197           35                    40                   45
2200 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2201      50                    55                   60
2204 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2205 65                    70                   75                   80
2208 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Cys Arg Ser
2209                85                    90                   95
2212 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2213                100                   105                  110
2216 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2217           115                   120                  125
2220 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
2221      130                   135                  140       145
```
E--> 2221

```
2224 <210> SEQ ID NO: 59
2225 <211> LENGTH: 145
2226 <212> TYPE: PRT
2227 <213> ORGANISM: Artificial Sequence
2229 <220> FEATURE:
2230 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg95
2232 <400> SEQUENCE: 59
2234 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2235 1                5                    10                   15
2238 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2239           20                    25                   30
2242 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2243           35                    40                   45
2246 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2247      50                    55                   60
```

```
2250 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2251 65                  70              75                  80
2254 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Cys Ser
2255                 85              90                  95
2258 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2259             100             105             110
2262 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2263         115             120             125
2266 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2267     130             135             140
2270 <210> SEQ ID NO: 60
2271 <211> LENGTH: 145
2272 <212> TYPE: PRT
2273 <213> ORGANISM: Artificial Sequence
2275 <220> FEATURE:
2276 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96
2278 <400> SEQUENCE: 60
2280 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2281 1               5               10              15
2284 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2285             20              25              30
2288 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2289         35              40              45
2292 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2293     50              55              60
2296 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2297 65                  70              75                  80
2300 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
2301                 85              90                  95
2304 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2305             100             105             110
2308 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2309         115             120             125
2312 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2313     130             135             140
2315 <210> SEQ ID NO: 61
2316 <211> LENGTH: 145
2317 <212> TYPE: PRT
2318 <213> ORGANISM: Artificial Sequence
2320 <220> FEATURE:
2321 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr97
2323 <400> SEQUENCE: 61
2325 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2326 1               5               10              15
2329 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2330             20              25              30
2333 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2334         35              40              45
2337 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
```

*145*

*145*

**RAW SEQUENCE LISTING**
PATENT APPLICATION: US/10/797,553C

DATE: 08/29/2005
TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
2338      50                    55                    60
2341 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2342 65                    70                    75                    80
2345 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2346                   85                    90                    95
2349 Cys Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2350                   100                   105                   110
2353 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2354              115                   120                   125
2357 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2358      130                   135                   140
2360 <210> SEQ ID NO: 62
2361 <211> LENGTH: 145
2362 <212> TYPE: PRT
2363 <213> ORGANISM: Artificial Sequence
2365 <220> FEATURE:
2366 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr98
2368 <400> SEQUENCE: 62
2370 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2371 1                  5                     10                    15
2374 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2375              20                    25                    30
2378 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2379              35                    40                    45
2382 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2383      50                    55                    60
2386 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2387 65                    70                    75                    80
2390 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2391                   85                    90                    95
2394 Thr Cys Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2395                   100                   105                   110
2398 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2399              115                   120                   125
2402 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2403      130                   135                   140
2405 <210> SEQ ID NO: 63
2406 <211> LENGTH: 145
2407 <212> TYPE: PRT
2408 <213> ORGANISM: Artificial Sequence
2410 <220> FEATURE:
2411 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Asp99
2413 <400> SEQUENCE: 63
2415 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2416 1                  5                     10                    15
2419 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2420              20                    25                    30
2423 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2424              35                    40                    45
```

RAW SEQUENCE LISTING                    DATE: 08/29/2005
PATENT APPLICATION:  US/10/797,553C     TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
2427 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2428     50              55              60
2431 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2432 65              70              75              80
2435 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2436             85              90              95
2439 Thr Thr Cys Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2440         100             105             110
2443 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2444     115             120             125
2447 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2448     130             135             140
2450 <210> SEQ ID NO: 64
2451 <211> LENGTH: 95
2452 <212> TYPE: PRT
C--> 2453 <213> ORGANISM: Artifical Sequence
2455 <220> FEATURE:
2456 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Gly-Gly-Cys at its
carboxy-terminus
2458 <400> SEQUENCE: 64
2460 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2461 1               5               10              15
2463 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2464             20              25              30
2466 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
2467         35              40              45
2469 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2470     50              55              60
2472 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2473 65              70              75              80
2475 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Gly Gly Cys
E--> 2476 86 90       85      95      90              95
2479 <210> SEQ ID NO: 65
2480 <211> LENGTH: 92
2481 <212> TYPE: PRT
C--> 2482 <213> ORGANISM: Artifical Sequence
2484 <220> FEATURE:
2485 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Asp in place of Asn52 and
Cys in place of Ser92
2487 <400> SEQUENCE: 65
2489 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2490 1               5               10              15
2492 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2493             20              25              30
2495 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
2496         35              40              45
2498 Val Gln Lys Asp Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2499     50              55              60
2501 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2502 65              70              75              80
2504 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
                 85              90
```

RAW SEQUENCE LISTING                     DATE: 08/29/2005
PATENT APPLICATION:  US/10/797,553C      TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

E--> 2505  87  90
2508 <210> SEQ ID NO: 66
2509 <211> LENGTH: 145
2510 <212> TYPE: PRT
2511 <213> ORGANISM: Artificial Sequence
2513 <220> FEATURE:
2514 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96 and hFSH
beta-subunit residues 95-108 for hCG beta-subunit residues 101-108
2516 <400> SEQUENCE: 66
2518 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2519 1               5                   10                  15
2522 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2523             20                  25                  30
2526 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2527         35                  40                  45
2530 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2531     50                  55                  60
2534 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2535 65                  70                  75                  80
2538 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
2539             85                  90                  95
2542 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
2543             100                 105                 110
2546 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2547         115                 120                 125
2550 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2551     130                 135                 140             145
E--> 2556 4

<210> 8
<211> 92
<212> PRT
<213> Artificial Sequence

<220>
<223> hCG alpha-subunit with Cys subsituted for Leu22

*Gly is at this location.*

<400> 8

Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Cys Gln Glu Asn Pro
1               5                   10                  15

Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
            20                  25                  30

Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
        35              40              45

Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
    50              55              60

Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
65              70              75              80

Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
            85                  90

*The type of errors shown exist throughout the Sequence Listing. Please check subsequent sequences for similar errors.*

RAW SEQUENCE LISTING ERROR SUMMARY          DATE: 08/29/2005
PATENT APPLICATION:   US/10/797,553C        TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

<u>Invalid Line Length:</u>
The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:57; Line(s) 2153
Seq#:65; Line(s) 2485
Seq#:66; Line(s) 2514

**VARIABLE LOCATION SUMMARY**          DATE: 08/29/2005
PATENT APPLICATION:  US/10/797,553C          TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

**Use of n's or Xaa's(NEW RULES):**   OK

Use of n's and/or Xaa's have been detected in the Sequence Listing.
Use of <220> to <223> is MANDATORY if n's or Xaa's are present.
in <220> to <223> section, please explain location of n or Xaa, and which
residue n or Xaa represents.

```
L:1203 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:36
L:1249 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:37
L:1297 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:38
L:1346 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:39
L:1748 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:45
L:1886 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:48
L:2142 M:258 W: Mandatory Feature missing, <222> Tag not found for SEQ ID#:56
L:2142 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0
L:2142 M:333 E: Wrong sequence grouping, Amino acids not in groups!
L:2143 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:56
L:2150 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:57
L:2173 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:57
M:332 Repeated in SeqNo=57
L:2176 M:252 E: No. of Seq. differs, <211> LENGTH:Input:92 Found:107 SEQ:57
L:2221 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:58
L:2267 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:59
L:2313 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:60
L:2358 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:61
L:2403 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:62
L:2448 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:63
L:2453 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:64
L:2476 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:64
L:2482 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:65
L:2505 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:65
L:2551 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:66
M:332 Repeated in SeqNo=66
```